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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,540	02/27/2004	Eric Sandstrom	DKT 03066A (BWI-00084)	9464

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EXAMINER	
KISWANTO, NICHOLAS	
ART UNIT	PAPER NUMBER
3609	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/789,540	SANDSTROM, ERIC	
	Examiner	Art Unit	
	Nicholas Kiswanto	3609	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

KHOI H. TRAN
SUPERVISORY PATENT EXAMINER

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 – 4, 6 –15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurihara (6,449,547), which henceforth shall be referred to as "Kurihara/547", in view of Ishii et al. (6,751,542), which henceforth shall be referred to as "Ishii/542", further in view of Yutkowitz(6,865,499), which henceforth shall be referred to as "Yutkowitz/499".

As to claim 1, Kurihara/547 shows method of calibrating an electrohydraulic control system that provides an output response in response to an input current (col 2, line 26 – 37), said method comprising: identifying a characteristic equation of the electrohydraulic system, said characteristic equation including a plurality of coefficients (col 3, line 23 – 42); measuring the output response of the electrohydraulic system (col 5, line 31 – 44), and identifying the coefficients in the characteristic equation from the output response measurements. (col 5, line 31 – 44).

Kurihara/547 does not show applying a plurality of currents to the electrohydraulic system and measuring the output response of the electrohydraulic system for each of the plurality of currents.

Ishii/542 shows a plurality of currents applied to an electrohydraulic system (col 7, line 34 – 38) and measuring the output response of the electrohydraulic system for each of the plurality of currents (col 7, line 34 – 38). Ishii/542 teaches that measuring the output response of a plurality of currents leads to a hysterisis characteristic being exhibited between the current and the output liquid pressure. Hence, a transmission map is generated, the map being an average output liquid pressure value at each current value from a static characteristic (col 2, line 29 – 34).

It would have been obvious to one of ordinary skill in the art to modify the invention of Kurihara/547 by adding a plurality of currents being applied to the electrohydraulic system and measuring the output in order to generate a transmission map (col 2, line 29 – 34), as taught by Ishii/542.

Kurihara/547 and Ishii/542 still do not show the electrohydraulic system coupled to a test stand.

Yutkowitz/499 shows an electrohydraulic system coupled to a test stand (Fig. 1).

It would have been obvious to one of ordinary skill in the art to modify the invention taught by Kurihara/547 and Ishii/542 by coupling the electrohydraulic

system to a test stand in order to extract the values from the electrohydraulic system when a plurality of currents are applied to it, as taught by Yutkowitz/499.

As to claim 2, Kurihara/547 further shows wherein identifying the coefficients in the characteristic equation from the output response measurements includes employing a curve fitting function (col 6, line 42 – 47).

As to claim 3, Kurihara/547 further shows wherein identifying the coefficients in the characteristic equation from the output response measurements includes employing a least squares fitting function. (6449547, 6, 42 – 47)

As to claim 4, Kurihara/547 does not show flashing the coefficients in a memory.

Ishii/542 shows wherein the method comprises flashing the coefficients in a memory (col 8, line 5 - 6).

It would have been obvious to one of ordinary skill in the art to modify Kurihara/547's invention by adding wherein the method comprises flashing the coefficients in a memory in order to preserve the data for future use, as taught by Ishii/542.

As to claim 6, Kurihara/547 does not show an electrohydraulic system that includes a proportional solenoid and a hydraulic valve, wherein applying a plurality of currents to the electrohydraulic system includes applying a plurality of currents to the proportional solenoid.

Ishii/542 shows an electrohydraulic system that includes a proportional solenoid (col 8, line 5 – 6) and a hydraulic valve (col 5, line 31 – 43), wherein applying a plurality of currents to the electrohydraulic system includes applying a plurality of currents to the proportional solenoid (col 7, line 34 - 38).

Ishii/542 teaches that measuring the output response of a plurality of currents leads to a hysterisis characteristic being exhibited between the current and the output liquid pressure. Hence, a transmission map is generated, the map being an average output liquid pressure value at each current value from a static characteristic (col 2, line 29 – 34).

It would have been obvious to one of ordinary skill in the art to modify the invention of Kurihara/547 by adding a plurality of currents being applied to the electrohydraulic system and measuring the output in order to generate a transmission map (col 2, line 29 – 34), as taught by Ishii/542.

As to claim 7, Kurihara/547 further shows an electrohydraulic system that is employed in an automatic transmission (col 2, line 39 – 40).

As to claim 8, Kurihara/547 further shows an electrohydraulic system that is employed in a pressure regulation system or a flow regulation system used for controlling functions in the automatic transmission (col 10, line 35 – 38).

As to claim 9, Kurihara/547 further shows an electrohydraulic system that includes an integrated transmission control unit (TCU) (col 4, line 20 – 21).

As to claim 10, Kurihara/547 further shows the output response of an electrohydraulic system is selected from the group consisting of pressure and fluid flow (col 10, line 35 – 38).

As to claim 11, Kurihara/547 does not show that applying a plurality of currents to the electrohydraulic system includes applying a plurality of different currents.

Ishii/542 shows an electrohyrdaulic system where applyin a plurality of currents includes applying a plurality of different currents (col 7, line 34 – 38). Ishii/542 teaches that measuring the output response of a plurality of currents leads to a hysterisis characteristic being exhibited between the current and the output liquid pressure. Hence, a transmission map is generated, the map being an average output liquid pressure value at each current value from a static characteristic (col 2, line 29 – 34).

It would have been obvious to one of ordinary skill in the art to modify the invention of Kurihara/547 by adding a plurality of currents being applied to the electrohydraulic system and measuring the output in order to generate transmission map (col 2, line 29 – 34), as taught by Ishii/542.

As to claim 12, Kurihara/547 shows a method of calibrating an electrohydraulic system employed in an automatic transmission (col 10, line 35 – 38), said electrohydraulic system providing an output response in response to an input current (col 5, line 31 – 44), said method comprising: identifying a characteristic equation of the electrohydraulic system, said characteristic equation including a plurality of coefficients (col 3, line 23 – 42); measuring the output response of the electrohydraulic system for a current applied to it (col 5, line 31 – 44); and identifying the coefficients of the characteristic equation from the output response measurements (col 5, line 31 – 44), wherein identifying the coefficients in the characteristic equation from the output response measurements includes employing a curve fitting function (col 6, line 42 – 47).

Kurihara/547 does not show that the electrohydraulic system comprises a proportional solenoid, a hydraulic valve, solenoid drive electronics, and a plurality of currents applied to the solenoid controlling the valve.

Ishii/542 shows an electrohydraulic system comprising a proportional solenoid (col 8, line 5 – 6), a hydraulic valve (col 5, line 32 – 33), solenoid drive electronics (col 8, line 5 – 6), and a plurality of currents applied to the solenoid

controlling the valve (col 7, line 34 – 38). Ishii/542 teaches that measuring the output response of a plurality of currents leads to a hysterisis characteristic being exhibited between the current and the output liquid pressure. Hence, a transmission map is generated, the map being an average output liquid pressure value at each current value from a static characteristic (col 2, line 29 – 34).

It would have been obvious to one of ordinary skill in the art to modify the invention of Kurihara/547 by adding a plurality of currents being applied to the electrohydraulic system and measuring the output in order to generate a transmission map (col 2, line 29 – 34), as taught by Ishii/542.

Kurihara/547 and Ishii/542 still does not show the electrohydraulic system coupled to a test stand.

Yutkowitz/499 shows an electrohydraulic system coupled to a test stand (Fig. 1).

It would have been obvious to one of ordinary skill in the art to modify the invention taught by Kurihara/547 and Ishii/542 by coupling the electrohydraulic system to a test stand in order to extract the values from the electrohydraulic system when a plurality of currents are applied to it, as taught by Yutkowits/499.

As to claim 13, Kurihara/547 further shows the electrohydraulic system employed in a pressure regulation system or a flow regulation system used for controlling functions in the automatic transmission (col 10, line 35 – 38).

As to claim 14, Kurihara/547 further shows where the step of identifying the coefficients in the characteristic equation from the output response measurements includes employing a least squares fitting function (col 6, line 42 – 47).

As to claim 15, Kurihara/547 further shows the output response of the hydroelectric system is selected from the group consisting of pressure and fluid flow (col 10, line 35 – 38).

3. Claims 16 – 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurihara/547 in view of Ishii/542.

As to claim 16, Kurihara/547 shows an electrohydraulic system comprising: a device for determining a characteristic equation of the electrohydraulic system, said characteristic equation including a plurality of coefficients (col 3, line 23 – 42); a device for measuring an output response of the electrohydraulic system from a current (col 5, line 31 – 44); and a device for determining the coefficients in the characteristic equation from the output response measurement (col 5, line 31 – 44).

Kurihara/547 does not show the electrohydraulic device comprising of a device for applying a plurality of currents to a proportional solenoid in the system.

Ishii/542 shows a device for applying a plurality of currents to a proportional solenoid in the system (col 7, line 34 - 38).

Ishii/542 teaches that measuring the output response of a plurality of currents leads to a hysterisis characteristic being exhibited between the current and the output liquid pressure. Hence, a transmission map is generated, the map being an average output liquid pressure value at each current value from a static characteristic (col 2, line 29 – 34).

It would have been obvious to one of ordinary skill in the art to modify the invention of Kurihara/547 by adding a plurality of currents being applied to the electrohydraulic system and measuring the output in order to generate a transmission map (col 2, line 29 – 34), as taught by Ishii/542.

As to claim 17, Kurihara/547 further shows the device that determines the coefficients in the characteristic equation from the output response measurement employs a curve fitting function (col 6, line 42 – 47).

As to claim 18, Kurihara/547 does not show a memory for storing the coefficients from the characteristic equation.

Ishii/542 shows an electrohydraulic system with a memory for storing coefficients (col 8, line 5 - 6).

It would have been obvious to one of ordinary skill in the art to modify Kurihara/547's invention by adding wherein the method comprises flashing the

coefficients in a memory in order to preserve the data for future use, as taught by Ishii/542.

As to claim 19, Kurihara/547 shows that the electrohydraulic system is employed in an automatic transmission (col 10, line 35 – 38).

As to claim 20, Kurihara/547 shows that the electrohydraulic system is employed in a pressure regulation system or a flow regulation system used for controlling functions in the automatic transmission (col 10, line 35 – 38).

As to claim 21, Kurihara/547 shows where the output response of the electrohydraulic system is selected from the group consisting of pressure and fluid flow (col 10, line 35 – 38).

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kurihara/547, in view of Ishii/542, further in view of Yutkowitz/499, further in view of Tsutsui et al. (5,782,711), which henceforth shall be referred to as "Tsutsui/711".

As to claim 5, Kurihara/547, Ishii/542, and Yutkowitz/499 disclose all elements per claimed invention as explained in paragraph 2 above.

However, Kurihara/547, Ishii/542 et al, and Yutkowitz/499 do not show the electrohydraulic system hard-coding the characteristic equation into control software.

Tsutsui/711 shows an electrohydraulic system that uses a commonly well-known method in the art of hard-coding the characteristic equation into control software (col 4, line 14 – 16).

It would have been obvious to one of ordinary skill in the art to modify the invention of Kurihara/547, Ishii/542, and Yutkowitz/499 by using the commonly well-known method in the art of hard-coding the characteristic equation into control software as demonstrated by Tsutsui/711.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Iwawa et al. (5,487,003) shows a method to provide data output from a set of input data, using least means square to achieve its results.

Boger et al. (2001/0037670) shows a valve positioner system that uses a process of discovering coefficients in a characteristic equation.

Funk, Sr. et al. (6,070,485) shows a solenoid shifter.

Todd et al. (7,231,317) shows a control system that has a plurality of currents applied to it and finds coefficients of various equations pertaining to the system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicholas Kiswanto whose telephone number is (571) 270-3269. The examiner can normally be reached on Monday - Friday, 8AM - 5PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Khoi Tran, can be reached on (571) 272-6919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nicholas Kiswanto
7/17/2007

KHOI H. TRAN
SUPERVISORY PATENT EXAMINER